

Exploring the Role of Platform Quality in Information Seeking Behavior on Climate-Induced Health Issues in Pakistan: A Social Media and Social Cognitive Theory Perspective

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Abstract

Climatic change is increasingly recognized as a crucial predictor of human health, driving shifts in disease patterns, heat-related vulnerability and morbidity among higher-risk populations. Furthermore, the proliferation of social media platforms has emerged as an innovative epidemiological surveillance tool, enabling real-time monitoring of public discourse, health-seeking behavior, and risk perception in relation to climate-sensitive health events. This research attempted to examine the pathways linking climatic variability to health outcomes, aiming to inform evidence-based adaptation strategies for public health systems. Specifically, scholars in behavioral science have investigated how social media platforms can be tailored to promote adaptation and pro-environmental behavior among the general public. However, despite this growing interest, limited empirical work has investigated the underlying psychological mechanisms such as emotional arousal that link social media platform quality to health-related information-seeking behavior in climate contexts, particularly within South Asian settings. Guided by Social Cognitive Theory, this research work as an attempt to examine the extent to which social media platform quality can influence information-seeking behavior regarding climate-related health challenges, particularly among the university's students in Pakistan. Moreover, the research work will also analyze the mediating role of emotional arousal in this context. Accordingly, the study extends Social Cognitive Theory's ternary interactive determinism to the domain of climate-health communication and provides practical implications for platform designers and health communicators seeking to improve public engagement with climate-related health information. Furthermore, the research is expected to inform policymakers, politicians, and social scientists in designing effective climate communication strategies to counter the alarming environmental threats to public health, infrastructure, and beyond.

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Introduction

Social media platforms have become one of the most powerful sources through which users encounter, interpret, and act on health-related information in their daily routines (Stifjell, Sandanger, & Wien,

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2025). As global change gradually intersects with public health through vector-borne disease, heat-related illness, deteriorating air quality, and emotional distress, social media has emerged as a main public sphere where individuals seek and react to climate-related health content (Refaat & Khafaga, 2026). Unlike mainstream media, social media platforms enable individuals to engage directly with information. Their adaptive content streams allow individuals to interact with content and receive personalized recommendations, determining not only what information individuals encounter but also how they perceive it and how they in turn respond to it. Platform quality is one of the leading factors individuals' engagements with health information on social networking platforms in information systems research. It describes the technical and experiential characteristics of the social media environment that collectively shape how effortlessly individuals can locate, access, utilize information on a platform (Ghalavand & Nabiolahi, 2024). A platform that is easily accessible, safeguard privacy, interactive in two ways, and delivers personalized content lessens the cognitive burden of information retrieval and improve individuals' readiness to remain engaged (Xiang & Ulrike, 2010). Because these design features functions on a subconscious level, their impact is supposed to extend beyond serviceability outcomes to decide individuals' emotional states while engaging with the platform. The mediating role of emotional arousal is comprehended through the Stimulus-Organism-Response (S-O-R) framework, initially proposed by (Mehrabian & Russell, 1980) which argues that environmental stimuli (S) affect an individual's emotional and cognitive states (O), which subsequently predict behavioral outcomes (R).

Climate change has been scientifically confirmed as one of the gravest threats to human health worldwide, with fluctuating precipitation patterns, intensifying temperatures, and gradually increasing extreme weather conditions driving a wide range of adverse health outcomes (Romanello, et al., 2023). The 2023 Lancet Countdown report, guided by the expertise of over one hundred scientists and health practitioners across more than fifty institutions, identified inadequate global response to protect world populations from these rising health risks, despite continued growth in fossil fuel investment (Romanello et al., 2023). Scientific studies consistently further confirm that changing climatic conditions are directly straining health systems, exacerbating existing vulnerabilities in renal, respiratory, cardiovascular, and mental health outcomes, while simultaneously testing the resilience and preparedness of healthcare infrastructure in responding to the increasing frequency of climate-related health issues (Vasileios, Kalogiannidis, Kalfas, & Kontsas, 2025). The global impacts of climate change are disproportionately distributed; however, low- and middle-income countries with limited resources and healthcare response capacities continue to experience greater adverse effects than high-income nations.

Pakistan is among the top ten countries disproportionately affected by global environmental disruption, despite contributing less than one percent of global greenhouse gas emissions (Somani, 2023). A nationwide survey of volunteer participants found that while public awareness of climate change was present across Pakistan's provinces, people were largely unable to translate this awareness into precautionary behavior regarding climate-related health problems (Irfan, et al., 2024). Correspondingly, empirical evidence from Karachi revealed widespread dissatisfaction among healthcare professionals, indicating weak intersectoral coordination and an inadequate governmental response to climate-related health threats, alongside calls for the official incorporation of climate-health content into medical and public health curricula (Tariq, Nazar, Rabab, & Ourangzaib, 2025).

Therefore, the role of social media is essential for climate-related health information. Global climate change has a far-reaching implication that are urgent, complex, and emotionally charged, ranging from extreme heat and deteriorating air quality to the psychological toll of eco-anxiety (Brosch, 2021). In this context effective communication can play an essential role in the emotionally engagement of individuals, thus, emotional state is yet another key aspect of the behavioral outcome (Peters, et al.,

2022).

Despite this, much of the existing literature has treated platform quality and emotional arousal as independent drivers of user behavior, while overlooking the crucial mediating role of emotional arousal in the relationship between the platform and the user. The growing scientific evidence investigates information and platform quality decide individuals affective state of individuals. However, no research study so far investigated the platform quality as the predictor while emotional arousal as mediator and information seeking behavior as behavioral outcome. This research aims to investigate whether emotional arousal functions as a mediating mechanism, rather than a parallel outcome, because it has implications for both theory and practice: it would extend the Ternary Interactive determinism to a health-relevant information ecosystem embedded within a global environmental issues, and it would explore whether policy makers and healthcare practitioners seeking to improve climate-health information seeking should prioritize the emotional experience a platform generates rather than assuming usability alone determines engagement.

Similarly, the present study seeks to investigate the relationship between platform quality and information seeking behavior regarding climate-related health information on social media, with particular attention to the mediating role of emotional arousal. Specifically, it investigates (a) the direct effect of platform quality on emotional arousal, (b) the direct effect of platform quality on information seeking behavior, and (c) the indirect effect of platform quality on information seeking behavior through emotional arousal. by explicating the directional pathways underlying these relationships, This study will build upon the existing scholarship on a more specific understanding of how social media platform layout shapes both individuals' emotional experience of climate-related health information and how intensively they seek further understanding, informing both the theoretical extension of (Bandura's 1977) Social Cognitive Theory to digital health communication and the practical design decisions of platforms and health communicators.

Literature Review

Platform Quality and Its Theoretical Grounding

Platform quality can be described as the technical dimensions of an online platform determine how effectively individuals can locate, assess, and act on information (Ghalavand & Nabiolahi, 2024). The conceptualization draws on the information systems success model, which holds that system design quality is a primary predictor of individuals' satisfaction and continued engagement (Delone & McLean, 2003). Within social cognitive theory, platform quality can be defined as an environmental factor determining individuals' ability to execute or perform and behavioral outcomes through dynamical interaction with personal and behavioral effects (Bandura, Social Cognitive Theory: An Agentic Perspective, 2001).

Applied to social media, platform quality is commonly breakdown into system usability, interactivity, privacy, personalization, and recommendation quality, each one is separately investigated in the literature as a predictor of interaction and information-seeking behavior (Stifjell et al., 2025).

System Usability

System usability refers to the ease with which users can utilize a platform's interface, find information, and complete information-seeking tasks without unnecessary cognitive effort. Usability is a foundational factor of technology acceptance, since baffling or incompetent interfaces increase the perceived cost of information retrieval and discourage sustained utilization (Weichbroth, 2024). Usability testing frameworks indicate that usability is not a single dimension but a composite of efficiency, learnability and error tolerance that collectively decide whether individuals sustained with a social media platform (Weichbroth, 2024). In the perspectives of health information seeking, Stifjell

et al. (2025) found that user-friendly design was among the platform attributes most reliably linked to young adults' continued interaction with health-related information, signifying usability functions as a gateway condition without which other platform characteristics have limited impact.

Interactivity

Interactivity refers to the extent to which a social media platform allows real-time exchange of information, feedback, and interactions between individuals and information or between individuals themselves. A systematic review of health-related social media posts found that supportive, emotive, and participatory communication factors were among the strongest drivers of individuals' participatory engagement (Yip, Bakry, & Chong, 2024). Interactivity has correspondingly been investigated as a crucial attribute, distinguishing social media from mainstream media, since it enables individuals to share, comment, and co-construct meaning around content rather than passively receiving it (Xiang & Gretzel, 2010). For health and risk information, interactive features such as discussion threads may increase individuals' perceived relevance of information, triggering further information-seeking practices.

Privacy

Safeguard Privacy can be described as individuals' perception that a platform satisfactorily shields their personal information during information-seeking practices. Because health-related information usually contains sensitive contents, privacy issues can undermine interaction even when other platform features are favorable (Hao, Lee, Sharko, & Li, 2024). The research study further explored that readiness to interact with personalized health information on social media was directly shaped by individuals' privacy concerns and confidence levels, with a larger proportion of users remaining reluctant or indeterminate about revealing personal health information. These findings indicate that privacy functions as a risk-mitigating factor of platform quality: users must trust a platform before engaging deeply enough to benefit from its other quality characters (Hao, Lee, Sharko, & Li, 2024).

Personalization and Recommendation Quality

Recommendation and personalization, as the capacity of a platform to tailor content and suggestions to individual users' demands, typically through algorithmic management (Huang & Liu, 2025). The study further claimed that users' awareness of the algorithms driving content recommendations increased both perceived utility and uncertainty, indicating recommendation quality affects behavior through a balance of utility and trust. Similarly, (Hao et al. 2025) claimed that a majority of surveyed users were willing to exchange personal health information for more personalized content, suggesting personalization can offset some privacy-related hesitancy when perceived as beneficial. Within social cognitive theory, well-matched recommendations may also strengthen users' competency by reducing search effort, reinforcing sustained interaction (Stifjell et al., 2025).

The existing literature indicates that system usability, interactivity, privacy, personalization, and recommendation quality each decide users' willingness to interact with health-related information on social media. However, these dimensions have typically been studied separately or within general health and consumer contexts rather than as a unified platform quality construct applied to climate-induced health information specifically. Few studies have examined how these attributes collectively affect information-seeking behavior within a social cognitive theory framework in a developing-country context such as Pakistan, where social media largely substitutes for formal health practices. This gap indicates a need for research treating platform quality as a composite construct and examining its impacts on climate-related health information seeking behavior.

Theoretical Framework

Platform Quality and Social Cognitive Theory's Triadic Reciprocal Determinism

The present research study is rooted in (Bandura's 2001) social cognitive theory, in Particular the principle of ternary interactive determinism. This theoretical approach argues that human function involves three rhetorically dynamic factors. (Environmental factor) to the external, situational, and social conditions that affect a person's behavior and, in turn, are affected by that behavior. (Cognitive Factor) refers to the internal mental processes through which individuals interpret, process, and respond to a stimulus from their environment. (Behavioral Factor) The actual execution of a certain course of action. All of these three factors operate in a continuous loop and each one simultaneously decides the other and decided by other two, formulating a mechanism of dynamic reciprocity rather than a one-directional stimulus-response chain.

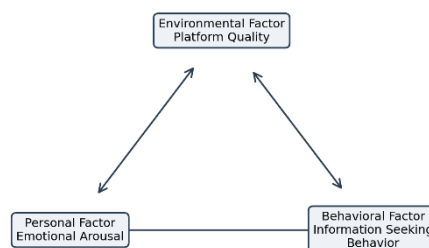
Social Cognitive Theory departs from earlier behaviorist approach by discrediting a narrowly linear model of behavior change, in which environmental stimuli were considered as the single predictor of behavioral outcome. Rather, this theoretical farmwork formulated a novel approach as it takes environmental, cognitive, and behavioral factors as three interrelated forces that function within an interactive system. For this, Bandura coined the dynamic *reciprocal causation*, a conceptualization envisioned to capture the notion that influence within the system, only just if ever, flows in a single direction (Bandura, 1989).

Within this triad, environmental factors such as the structural and situational conditions surrounding a person in the context of digital health communication, this might include the architecture of a social media platform, the algorithmic prioritization of content, and the broader social environment of individual level interaction that a person encounters online.

Applied to the present research perspective, this mutually dynamic structure indicates that the social media platform does not simply acts a one-way influence on how individuals emotionally process climate-related health content. Rather, the emotional and cognitive responses generated by that content shape the extent to which individuals seek further information, and this information-seeking behavior, in turn, changes the environments they afterward inhabit through personalized feedback, the curation of future information, or shifts in the social discourse they choose to interact with. It is this continuous, reciprocally constitutive process, rather than a single causal pathway, that the present study seeks to interrogate.

Figure 1

Ternary Interactive Determinism Applied to Platform Quality, Emotional Arousal, and Information Seeking Behavior



The Ternary Interactive framework is unique from a from a unidirectional one: however, this an attempt to test a directional pathway from platform quality through emotional arousal to information seeking behavior, yet the framework proposes that search experiences feed back into platform interaction, the completing the continuous loop of climate-related health information seeking over

time.

Methodology

The present research study applied a quantitative approach to analyze the continued information seeking behavior practices among young university students, given the need to statistically test the pathways among platform quality, emotional arousal, and information seeking behavior regarding climate-induced health complications. A cross-sectional survey framework was employed, utilizing a structured questionnaire administered to the young university male-female enrolled students who actively used social media in Pakistan. A systematic sampling technique was used to recruit participants, as it allows speedy access to a population that regularly engages with climate-related health content online.

Measurement

The key variables employed in this research — platform quality, emotional arousal, and information-seeking behavior were assessed using multi-item scales adapted from previously validated measures, scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Platform quality variable was operationalized through five sub-dimensions: system usability, interactivity, privacy, personalization, and recommendation quality. Emotional arousal variable was measured through items capturing emotion regulation, cognitive control under emotion, emotional awareness, and cognitive reappraisal. Information seeking behavior as behavioral variable, was assessed through items indicating active engagement with, and sustained practice of, climate-related health information on social media. Before conducting hypothesis testing, each scale was assessed for internal consistency reliability, with all variables demonstrating acceptable to good reliability, supporting their suitability for further statistical analysis.

Data Analysis

Data were analyzed using descriptive statistics, such as mean, standard deviation and regression-based mediation analysis. Descriptive statistics were computed to summarize respondents' demographic characteristics and response patterns across study variables. Pearson correlation coefficients were then calculated to examine the strength and direction of the relationships among platform quality, emotional arousal, information seeking behavior, and the study's other variables. Finally, hierarchical regression analysis was conducted to test the direct effect of platform quality on information seeking behavior, followed by the introduction of emotional arousal as a mediator, in order to determine whether its inclusion significantly altered the strength of the direct path, consistent with established procedures for testing mediation.

Table 1: Mean and Standard Deviations of Respondents' Perceptions of the Platform Quality Variable (N = 450)

Items	Dimensions	Survey Item	Level of Agreement					M	SD
			SD		SA				
			1	2	3	4	5		
PQ1	System Usability	Social media platforms are easy to navigate when searching for information on climate-induced health risk	(8.2%)	(12.2%)	(18.9%)	(35.1%)	(25.6%)	3.58	1.22
PQ2		Social media platforms facilitate	(4.9%)	(13.3%)	(26.0%)	(31.8%)	(24.0%)	3.57	1.14

Items	Dimensions	Survey Item	Level of Agreement					M	SD
			SD		SA				
			1	2	3	4	5		
		my interaction with others who share concerns about climate-induced health issues.							
PQ3	Privacy	Social media platforms safeguard my personal information when I search for climate-induced health-related content.	(8.4%)	(14.9%)	(23.3%)	(34.2%)	(19.1%)	3.41	1.20
PQ4	Personalization	Social media platforms provide me with health information about climate change that matches my needs.	(10.7%)	(11.8%)	(22.4%)	(31.3%)	(23.8%)	3.46	1.27
PQ5	Recommendation Quality	The recommendations I receive on social media are useful for understanding climate-related health risks.	(7.3%)	(7.8%)	(29.1%)	(28.2%)	(27.6%)	3.61	1.18

Table 1 presents respondents' perceptions across the five dimensions of platform quality: system usability, interactivity, privacy, personalization, and recommendation quality. All five items recorded mean scores above the scale midpoint of 3.00, ranging from 3.41 to 3.61, indicating moderately favorable perceptions of the social media platforms respondents use to seek climate-related health information. The mean value for the recommendation feature stands at $M = 3.61$ ($SD = 1.18$). Similarly, the mean score for system usability yielded $M = 3.58$ ($SD = 1.22$). The statistics show that these two dimensions are the most favorably rated, with 55.8% and 60.7% of participants, respectively, showing agreement with the given statements.

Therefore, it can be claimed that the young adults are preferring social media platforms for their ease of operation and for the retrieval of useful information about climate-related health complications. Furthermore, the mean score for interactivity stands at $M = 3.57$ ($SD = 1.14$), following closely behind, with a 55.8% level of agreement. These results show that social media platforms allow seamless interaction with other community members who have similar health complications, in this context the participatory nature of social media as an information seeking environment. Personalization, by comparison, yielded a somewhat lower mean score ($M = 3.46$, with standard deviation $SD = 1.27$), following over 50 % of agreement among the participant. In that way this implies that although many participants perceived platforms as personalizing content to their needs, a significant proportion of the respondents are also remained neutral or unconvinced.

For Privacy the mean value is the lowest among the five dimensions ($M = 3.41$, while the statistics recorded standard deviation of $SD = 1.20$), with only 53.3% agreement and the highest disagreement rate (23.3%) in the table. This indicates that privacy remains the most contested aspect of platform quality in respondents' experience, even as they continue using these platforms to seek health

information. Overall, the survey participants perceive social media platforms as rationally serviceable, interactive, and useful for recommendations, but comparatively less dependable regarding data protection – a distinction with direct implications for how platform quality translates into sustained climate-related health information-seeking behavior.

Hypotheses

H1. Information Quality positively influences Information Seeking Behavior.

H2. Emotional Arousal positively influences Information Seeking Behavior.

H3. Emotional Arousal Mediates the relationship between Information Quality and Information Seeking Behavior.

Mediation Model: Platform Quality → Emotional Arousal → Information Seeking Behavior

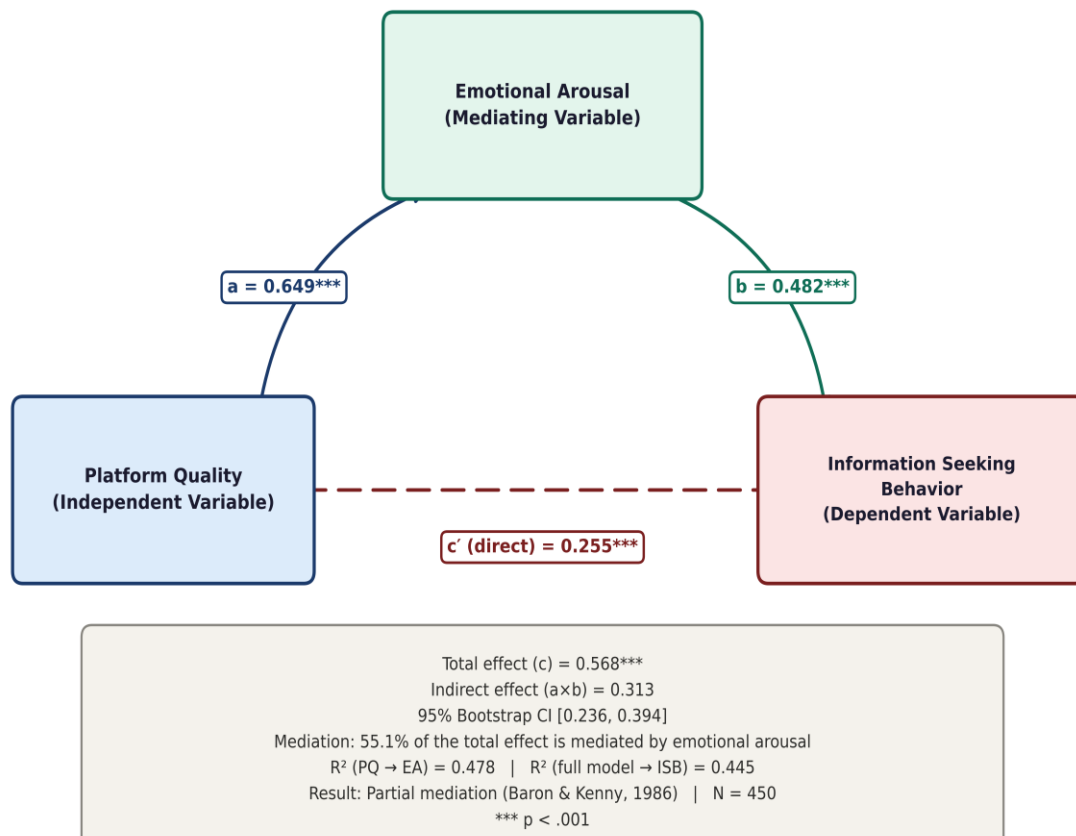


Figure 2

Mediating Role of Emotional Arousal in the Relationship Between Platform Quality and Information Seeking Behavior

Note. PQ = Platform Quality; EA = Emotional Arousal; ISB = Information Seeking Behavior. Path a is the effect of PQ on EA; path b is the effect of EA on ISB, controlling for PQ. c' is the direct effect of PQ on ISB after accounting for EA; c is the total effect of PQ on ISB without EA in the model. Bootstrap estimates are based on 5,000 resamples following Hayes (2018).

Table 2 Regression Analysis of the Mediating Role of Emotional Arousal in the Relationship Between Platform Quality and Information Seeking Behavior

Path	β	SE	t	P	R ²
PQ → EA (Path a)	.649	.032	20.24	< .001	.478
PQ → ISB (Total Effect c)	.568	.038	14.99	< .001	.334
PQ → ISB (Direct Effect c')	.255	.048	5.32	< .001	.445
EA → ISB (Path b)	.482	.051	9.45	< .001	.445

Note

- $N = 450$
- β = standardized regression coefficient
- SE = standard error
- R^2 = coefficient of determination
- PQ = Platform Quality
- EA = Emotional Arousal
- ISB = Information Seeking Behavior
- Path a: effect of PQ on the mediator (EA)
- Path b: effect of EA on ISB, controlling for PQ
- Total Effect (c): effect of PQ on ISB without the mediator in the model
- Direct Effect (c'): effect of PQ on ISB when EA is included as a mediator
- The reduction from the total effect ($\beta = .568$) to the direct effect ($\beta = .255$) indicates that EA partially mediates the relationship between PQ and ISB
- $p < .001$ for all paths

Table 3: Bootstrapped Estimates of the Indirect (Mediated) Effect of Information Quality on Information Seeking Behavior via Emotional Arousal

Effect	β	Boot SE	95% Boot CI
Indirect Effect ($a \times b$)	.328	.045	[.215, .436]

Note.

- β = Standardized indirect effect.
- Boot SE = Bootstrapped standard error.
- 95% Boot CI = Bias-corrected 95% bootstrap confidence interval.
- The indirect effect ($a \times b$) represents the mediating effect of Emotional Arousal (EA) on the relationship between Information Quality (IQ) and Information Seeking Behavior (ISB).
- Bootstrap estimates were generated using 5,000 bootstrap resamples following the procedure recommended by Hayes (2018).
- The 95% bootstrap confidence interval does not include zero, indicating that the indirect

effect is statistically significant and supporting the mediation hypothesis.

- *All reported coefficients are standardized.*

The mediating and direct hypotheses tests were performed among the platform quality, emotional arousal and information seeking variables to investigate whether Emotional Arousal positively mediates the relationship between platform quality and information seeking behavior.

The results demonstrate that platform quality has a strong statistically positive impact on emotional arousal ($\beta = .649$, $p < .001$), accounting for 47.8% of the variance in EA ($R^2 = .478$). This implies that individuals who perceive the social media platform as functionally sound in terms of usability, interactivity, privacy, personalization and recommendation experience substantially heightened emotional engagement when exposing to climate-related health information.

The findings further indicate that the total effect model verified that platform quality has a significant positive effect on information seeking behavior ($\beta = .568$, $p < .001$, $R^2 = .334$). Therefore, the findings indicate that users who perceive platform quality as higher tend to utilize it for additional information about the issue of climate change and its subsequent health impacts. When emotional arousal was introduced as a mediator into the regression analysis, the direct impact of platform quality on the criterion (information seeking behavior) reduced from $\beta = .568$ to $\beta = .255$ but remained significant ($p < .001$). Simultaneously, emotional arousal had a significant positive effect on information-seeking behavior ($\beta = .482$, $p < .001$). After the introduction of mediator (Emotional Arousal) the value for the pathway declined in the regression analysis model which suggests the presence of partial mediation. This indicates that emotional arousal explains a significant portion of the relationship between platform quality and information seeking behavior, even though platform quality also continues to exert a powerful direct effect on information seeking.

The indirect effect model further confirmed the mediating relationship. The bootstrapped indirect effect was statistically significant ($\beta = .313$, 95% CI [.236, .394]). Since the confidence interval did not include zero, the mediation effect is statistically supported. The full mediation analytical model explained 44.5% of the variance in Information Seeking Behavior ($R^2 = .445$).

Overall, the statistics demonstrate that a platform high in quality triggers emotional activation among the users, which in turn inspires them to involve in active information seeking behavior.

Therefore, the alternative hypothesis is supported.

CONCLUSION

This article investigated the extent to which platform quality shapes information-seeking behavior regarding climate-related health information among university students in Pakistan, with particular attention to the mediating role of emotional arousal. Based on (Bandura's 1977) Social Cognitive Theory perspective, and precisely its principle of Ternary Interactive determinism, the results provide strong statistical support for the proposition that environmental, cognitive-affective, and behavioral factors function not as isolated determinants but act as interactive forces within a continuous loop, dynamically deciding the fate of one another.

The findings highlight that platform quality cause a significant impact on emotional arousal, confirming that the technical and experiential attributes of social media environments usability, interactivity, privacy, personalization, and recommendation quality actively decide individuals' affective states when interacting with climate-related health information, rather than operating as solely usability conveniences. More precisely, emotional arousal was found to partially mediate the relationship between platform quality and information-seeking behavioral outcome. While platform

quality exercises a direct and meaningful effect on individuals' inclination to seek further information, a larger share of this relationship functions through the emotional responses that well-designed platforms provoke. This implies that functionality alone cannot fully account for sustained engagement; rather, emotional experience functions as a critical psychological mechanism translating structural platform quality into actual behavioral outcome.

The results advance the application of Social Cognitive Theory into the domain of climate and health communication utilizing social media environment within a country level context of Pakistan that remains underrepresented in this research stream despite its acute vulnerability to climate-related health threats. The study thus addresses a meaningful empirical and contextual gap, demonstrating that theoretical assumptions long applied in Western and high-income settings retain explanatory value within a South Asian developing-country context.

From a practical standpoint, the results carry direct implications for platform designers and health communication experts. Efforts to increase public interaction with climate-related health information should extend beyond usability improvements alone to deliberately incorporate strategies capable of generating meaningful emotional engagement, given its essential role in driving information-seeking behavior. For policymakers and public health practitioners, the results underscore that social media constitutes a viable and increasingly crucial means for climate-related health risk communication, offered platforms are curated to be emotionally charging as well as functionally sound.

The study is not without limitations. Its cross-sectional design precludes causal inference, and reliance on a university student sample limits generalizability to broader populations differing in digital literacy and platform usage patterns. Future research would benefit from longitudinal or experimental designs capable of establishing temporal precedence among study variables, along with extension to more diverse demographic and geographic populations. Future studies might also examine boundary conditions such as individual level differences in climate anxiety or digital trust that could mediate or moderate the pathways identified here.

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